UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,475	10/31/2003	Oleg Kiselev	VRT0096US	2736

60429 7590 06/09/2006

CSA LLP
4807 SPICEWOOD SPRINGS RD.
BLDG. 4, SUITE 201
AUSTIN, TX 78759

EXAMINER	
PEIKARI, BEHZAD	

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 06/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,475	KISELEV, OLEG	
	Examiner	Art Unit	
	B. James Peikari	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: The central processor in Figure 4 is labeled as Reference 416, in the specification it is labeled as Reference 414. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The previous rejection of claim 11 under the second paragraph of 35 U.S.C. 112 is withdrawn due to the amendment filed on March 13, 2006.

3. The previous rejection of claim 24 under the second paragraph of 35 U.S.C. 112 is withdrawn due to the remarks attached to the amendment filed on March 13, 2006.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-23 and 42-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zlotnick et al., US Pub. No. 2004/0205312, (hereinafter, "Zlotnick") in view of Yanai et al., U.S. 5,742,792 (hereinafter, "Yanai").

7. As per claims 1, 42, 44 and 49, Zlotnick discloses replicating a change to data from first data storage in a first security domain to a second security domain (Paragraphs 11 and 25), wherein the first security domain and the second security domain are independent of each other (Fig 1, Ref 8 and 18; Paragraph 25); and completing the change to the data in the first security domain in response to receiving an acknowledgement that the change to the data has been stored in second data storage in the second security domain [Zlotnick discloses that an acknowledgment is required in order to not delay the system, thus a write can not be completed without the acknowledgment being received (Paragraph 28)].

Zlotnick fails to explicitly disclose the feature: "the first security domain permits a first host to access the first data storage, and the first security domain prohibits a second host from directly accessing the first data storage". However Zlotnick does disclose that Host 2 may represent plural hosts. If the Primary Controller 6 happened to allow one host to access Primary Storage 4 and deny access to another host, this would teach all of the independent claims of the invention, since none of these claims require that a host be associated with the second security domain.

In any case, this feature is explicitly taught by Yanai, which has a first and second host independently controlling first and second local networks. Note Figure 1 and, e.g., column 4, lines 50 et seq., which discuss the situation where failure occurs a given location and access to the remote location by the host of the given location is denied in order to keep the failure from spreading (cf. applicant's disclosure of the invention, which describes this reason as being at the heart of the invention), while the remote host may still have full access to the remote system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the structure and security of Yanai, including a first host controlling access to the first security domain and the remote host controlling access to the remote security domain, into the system of Zlotnick et al., since this would (1) provide more security, (2) provide greater fault tolerance by preventing the spread of failure and (3) Zlotnick already suggested use of multiple hosts.

8. As per claim 2, Zlotnick discloses the method of claim 1 wherein

the replicating is performed over a controlled link from a first host in the first security

domain to a second host in the second security domain [Zlotnick discloses a

dedicated line between the primary and secondary sites, since the line is dedicated, it provides access to only the primary and secondary sites and is thus controlled (Paragraph 22; Fig 1, Ref 20)].

9. As per claim 3, Zlotnick discloses the method of claim 2 wherein

only the controlled link couples the first host to the second host (Fig 1, Ref 20).

10. As per claim 4, Zlotnick/Yanai discloses the method of claim 1 wherein

a first host controls access to the first security domain; and

a second host controls access to the second security domain.

Note Yanai, column 4, lines 50 et seq.

11. As per claim 5, Zlotnick discloses the method of claim 4 further comprising:

the first host accessing data stored in the second security domain by requesting the

data stored in the second security domain from the second host [Zlotnick discloses that a secondary host controls access to the secondary site (security domain), thus in order to request data store in the second security domain, the first host must get permission from the secondary controller, this is interpreted as requesting the data (Paragraph 5)].

12. As per claim 6, Zlotnick discloses the method of claim 4 wherein

the second data storage is inaccessible directly by the first host [Applicant defines a

host as a node in the specification. The second data storage (Fig 1, Ref 14) is separated from the first host (Fig 1, Ref 8) by a secondary controller (Fig 1, Ref 16), thus it is inaccessible directly by the first host].

13. As per claim 7, Zlotnick discloses the method of claim 4 wherein

the first data storage is inaccessible directly by the second host [The primary data

storage (Fig 1, Ref 4) is separated from the second host (Fig 1, Ref 18) by a primary controller (Fig 1, Ref 6), thus it is inaccessible directly by the first host].

14. As per claim 8, the method of claim 1 wherein

the completing the change comprises

notifying an application making the change to the data that the change is

complete [the system of Zlotnick acknowledges the host (Fig 1, Ref 2), this is the application making the change to the data].

15. As per claim 9, Zlotnick discloses the method of claim 1 further comprising:

using the data from the second data storage when the first data storage fails [Zlotnick

discloses that data storage systems may maintain a secondary copy of data at a remote site to use in the event of a failure at the primary site (Paragraph 4)].

16. As per claim 11, Zlotnick discloses the method of claim 1 wherein the first data storage and the second data storage are not connected to one network

[Please see 112 rejection, Zlotnick discloses the connection can be a WAN, SAN or Internet (Paragraph 22)].

17. As per claim 12, Zlotnick discloses the method of claim 1 further comprising: replicating a second change to the data in the first data storage to the second security

domain after the acknowledgement is received [The system of Zlotnick waits for an acknowledgment to be received, then continues to process writes according to a parameter specifying number of synchronous writes to process. Thus, after the acknowledgment is received, a second change to the data in the first data storage is processed (Paragraph 28 and 29)].

18. As per claim 13, Zlotnick discloses the method of claim 12 further comprising: completing the second change in the first security domain when a second acknowledgement is received that the second change to the data has been

stored in the second storage area [All synchronous writes are acknowledged when stored in the secondary storage, and thus completed by going on to the next write (Paragraphs 28 and 29)].

19. As per claim 14, Zlotnick discloses the method of claim 1 further comprising:

restoring the data in the first data storage from the second data storage when the data

are corrupted [Data can be recovered from secondary site storage(Paragraph 4)].

20. As per claim 15, Zlotnick discloses the method of claim 1 wherein

the first data storage comprises a log [Zlotnick discloses a queue, which is a type of log

(Fig 1, Ref 28 and 30)].

21. As per claim 43, please see rejection of claim 2 above.

22. As per claim 45, please see rejection of claim 2 above.

23. As per claim 46, please see rejection of claim 9 above.

24. As per claim 48, please see rejection of claim 14 above.

25. As per claim 50, please see rejection of claim 2 above.

26. As per claim 51, please see rejection of claim 9 above.

27. As per claim 53, please see rejection of claim 14 above.

28. As per claim 10, Zlotnick discloses the method of claim 1. Zlotnick further suggests the method comprising:

reading a first portion of the data from the first data storage; and

requesting a second portion of the data from a second host coupled to the second data

storage [Zlotnick describes volumes (Fig 1, Ref 10) within a primary storage (Fig 1, Ref 4). If one volume fails, the system would read the unfailed data from the primary storage, and get the data from the corrupted volume from the corresponding volume (Fig 1, Ref 12) in secondary storage (Fig 1, Ref 14)].

29. As per claim 47, please see rejection of claim 10.

30. As per claim 52, please see rejection of claim 10.

31. Regarding claims 10, 47 and 52, it would have been obvious to one having ordinary skill in the art at the time the invention was made to copy individual volumes of Zlotnick when volumes are corrupted in primary storage since would allow for faster restoration of services and data within the corrupted primary system. Copying only the corrupted volumes would be much faster than copying all the data in the secondary storage system.

* Claims 16 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Zlotnick/Yanai combination (hereinafter "Zlotnick") as applied to claim 1 above, and further in view of Orsley et al (US Pub No 2004/0059869).

32. As per claim 16, Zlotnick discloses the method of claim 1. Zlotnick does not disclose the method further comprising:

saving a version of data stored in the second data storage prior to storing the change to

the data in the second data storage.

Orsley discloses saving a version of data stored in the second data storage prior to

storing the change to the data in the second data storage [using a backed-up data set and the write log to return to the state of the data set at any time before the current state of the data set. Thus the data stored in the second

storage is saved prior to storing the change to the data in the second data storage (Paragraph 40)].

33. As per claim 17, the combination of Zlotnick and Orsley disclose the method of claim 16. Orsley further discloses the method wherein

both the version of the data and the change to the data are accessible after storing the

change to the data in the second data storage [In the system of Orsley, since the old data can be restored using the write log, both the version of the data and the change to the data are accessible after storing the change to the data in the second data storage (Paragraph 40)].

34. As per claim 18, the combination of Zlotnick and Orsley disclose the method of claim 1. Orsley further discloses the method wherein

the second data storage comprises a log (Fig 4A, Ref 26).

35. As per claim 19, the combination of Zlotnick and Orsley disclose the method of claim 18. Orsley further discloses the method comprising:

constructing a current version of the data from the log [Writes of Orsley go through the

log and are put into the mirror area, thus constructing the current version of the data (Paragraph 38)].

36. As per claim 20, the combination of Zlotnick and Orsley disclose the method of claim 1. Orsley further discloses the method wherein

the second storage comprises

a log (Fig 4a, Ref 26), and

a storage volume (Fig 3C, Ref 17).

37. As per claim 21, the combination of Zlotnick and Orsley disclose the method of claim 20. Orsley further discloses the method comprising:

writing the change to the data to the log (Paragraph 38); and

writing the change to the data from the log to the storage volume (Par. 38).

38. As per claim 22, the combination of Zlotnick and Orsley disclose the method of claim 21. Orsley further discloses the method comprising:

allocating space in the second data storage for the change to the data when writing the

change to the data from the log to the storage volume [The log stores the updated data and the address in the data set where the updated data is to be stored, thus the space must be allocated in the storage device (Paragraph 40)].

39. As per claim 23, the combination of Zlotnick and Orsley disclose the method of claim 20. Orsley further discloses the method comprising:

writing an oldest change to the data from the log to the storage volume [Orsley discloses that most recently written data is likely stored in the log, thus older data must be written out of the log first (Paragraph 43)].

* Regarding claims 16-23, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the write log of Orsley into the system of Zlotnick, since Zlotnick and Orsley form the same field of endeavor, namely data backup and this would allow for rolling back to data stored at an earlier time (Paragraph 8).

* Claims 24 - 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Zlotnick/Yanai combination (hereinafter "Zlotnick") as applied to claim 1 above, and further in view of Sawdon et al (US Pub No. 2003/0158834)

40. As per claim 24, Zlotnick discloses the method of claim 1. Orsley further discloses the method wherein
the second data storage comprises
a log (Fig 4a, Ref 26), and
a storage volume (Fig 3C, Ref 17), and
Zlotnick and Orsley do not disclose a set of snapshots of the storage volume. Sawdon discloses a set of snapshots of the storage volume [set of file system snapshots (Paragraph 12)].

41. As per claim 25, Zlotnick, Orsley and Sawdon disclose the method of claim 24. Sawdon further discloses the method comprising:

periodically making a new snapshot of the set of snapshots (Paragraph 12).

42. As per claim 26, Zlotnick, Orsley and Sawdon disclose the method of claim 25. Sawdon further discloses the method comprising:

allocating a portion of the second data storage for storing the new snapshot when the

new snapshot is made (Paragraph 166).

43. As per claim 27, Zlotnick, Orsley and Sawdon disclose the method of claim 26. Sawdon further discloses the method wherein

the portion comprises storage for each block of a plurality of blocks in the storage

volume (Paragraph 166).

44. As per claim 28, Zlotnick, Orsley and Sawdon disclose the method of claim 24. Sawdon further discloses the method wherein

at least one of the set of snapshots is a copy-on-write snapshot (Paragraph 165).

45. As per claim 29, Zlotnick, Orsley and Sawdon disclose the method of claim 28. Sawdon further discloses the method wherein

the copy-on-write snapshot is a most recent snapshot of the set of snapshots (Paragraph 165).

46. As per claim 30, Zlotnick, Orsley and Sawdon disclose the method of claim 28 further comprising:

Orsley discloses writing the change to the log (Paragraph 38),

Sawdon discloses writing a version of data in the storage volume to the copy-on-write

snapshot (Paragraph 128), and

Sawdon further discloses writing the change to the data to the storage volume after

writing the version of the data to the copy-on-write snapshot [Snapshot is updated in accordance to at least one source file corresponding to the snapshot (Paragraph 12)].

47. As per claim 31, Zlotnick, Orsley and Sawdon disclose the method of claim 24. Sawdon discloses the method wherein

at least one of the set of snapshots is an instant snapshot [The snapshot is a point-in-

time snapshot, thus it is an instant snapshot (Paragraph 128)].

48. As per claim 32, Zlotnick, Orsley and Sawdon disclose the method of claim Sawdon further discloses the method comprising:

combining data from at least two snapshots of the set of snapshots into a combined

snapshot (Paragraph 112); and

deleting the at least two snapshots (Paragraph 112).

49. As per claim 33, Zlotnick, Orsley and Sawdon disclose the method of claim 32. Sawdon further discloses the method comprising

the at least two snapshots were created at adjacent points in time [data from one

snapshot is copied into the next oldest snapshot, thus the snapshots are adjacent (Paragraph 112)].

* Regarding claims 24-33, It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the copy on write snapshots of Sawdon into the system of Zlotnick and Orsley, since Zlotnick, Orsley and Sawdon form the same field of endeavor, namely date backup and protection and this would allow for efficient backup of data, allowing for backups at various points in time and more efficient use of storage space.

* Claims 34 - 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Zlotnick/Yanai combination (hereinafter "Zlotnick") as applied to claim 1 above, and further in view of Sawdon et al (US Pub No. 2003/0158834)

50. As per claim 34, the combination of Zlotnick and Orsley disclose the method of claim 1. Orsley further discloses the method wherein

the second data storage comprises

a log (Fig 4a, Ref 26), and

a storage volume (Fig 3C, Ref 17), and

a set of overlay storage objects, wherein

each overlay storage object of the set comprises respective data to be

applied to the storage volume [the baseline dataset is updated with update data at given time points (Paragraph 38)].

As per claim 35, Zlotnick and Orsley disclose the method of claim 34. Orsley further discloses the method comprising:

writing the change to the data to the log (Paragraph 38);

writing the change to the data from the log to one overlay storage object of the set

[data is transferred from the log file in the mirror area to a final address in the data set in the stripe area (Paragraph 38)].

51. As per claim 36, Zlotnick and Orsley disclose the method of claim 35. Orsley further discloses the method wherein

the one overlay storage object is a most recent overlay storage object of the set [data is

updated to the data set in stripe area from the log, since the log writes oldest data first, each update address is the most recent overlay storage object (Paragraph 40)].

52. As per claim 37, Zlotnick and Orsley disclose the method of claim 34. Orsley further discloses the method comprising:

reading data in the second data storage by

reading the respective data from at least one overlay storage object of the set of overlay storage objects [updated data is stored in a final address, thus this

is the newest data used in a read (Paragraph 38)], and

reading other data in the second data storage from the storage volume [baseline

data set provides data not available in the overlays (Fig 3A, Ref 24)].

53. As per claim 38, Zlotnick and Orsley disclose the method of claim 37. Orsley further discloses the method wherein

the reading the respective data comprises reading the respective data in an order

determined by a respective time for that each overlay storage object was

created [log provides the timestamps and data set update addresses, thus timestamps must be used to read data from the dataset in the proper order (Paragraph 40)].

54. As per claim 39, Zlotnick and Orsley disclose the method of claim 34. Orsley further discloses the method comprising:

writing the respective data from one overlay storage object of the set of overlay storage

objects to the storage volume [dataset updates are moved from the log in the mirror area to stripe area (Paragraph 38)].

55. As per claim 40, Zlotnick and Orsley disclose the method of claim 39. Orsley further discloses the method wherein

the one overlay storage object is an oldest overlay storage object of the set [data sets

are managed according to timestamps in the log, thus oldest overlay storage object must be moved first (Paragraph 40)].

56. As per claim 41, Zlotnick and Orsley disclose the method of claim 39. Orsley further discloses the method comprising:

deleting the one overlay storage object [data is transferred from mirror area to stripe area, therefore the data is not held in the mirror area and is thus deleted (Paragraph 38)].

* Regarding claims 34-41, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the overlay storage objects of Orsley into the system of Zlotnick, since Zlotnick and Orsley form the same field of endeavor, namely data backup and this would allow for keeping a consistent baseline data set and updates at later times to the dataset (Paragraph 40).

Conclusion

57. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

58. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).

B. James Peikari
Primary Examiner
Art Unit 2189
5/30/06